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## EUROPEAN PATENT APPLICATION

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**54. Security seal.**

(57) Safety seal made of a plastic strip (1) fitted at one end with a thickening (3) housing a metal plate (8) fitted with an opening (9, 9', 9'') with a boundary slightly smaller than that of the area where the flexible strip is to be fixed (1) and which through peripheral tabs (11) leaning in the direction of introduction of the strip (1) allow its passage in one direction at the same time that they prevent its withdrawal. The strip (1) may be fitted with locking teeth or not, and is further fitted with a tab (10) and weakening lines (20) to facilitate its breakage, as well as grading marks (18) to allow establishing how many times it has been reused.

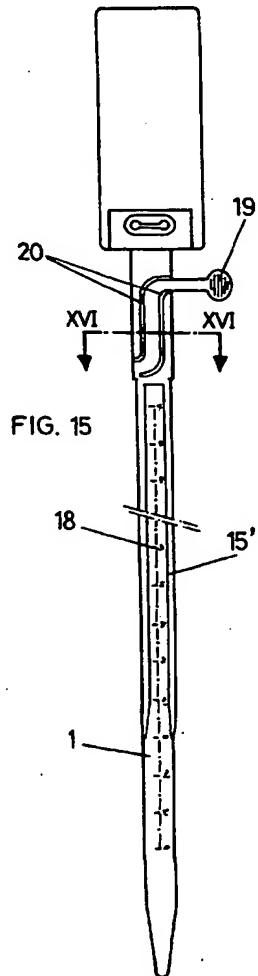


FIG. 15

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This invention refers to a security seal, of the type made up of a plastic or similar material flexible strip, ending on a wider section fitted with a passage through which the strip may be inserted, starting at its free end, and including strip holding means.

The seals of the type mentioned may be used to fix labels and similar items, as well as to serve as informative elements in respect of the possible violation or undue handling of a given object or article.

Within the seals of the type mentioned it is already known the practice of forming in the widening section of the strip a thicker part through which the passage made for the introduction of the flexible strip may be effected. This passage presents an intermediate narrowing, formed for example by way of a transversal step or tooth to which a certain inclination has been given, being the passage sized so as to allow the passage of the strip. On the other hand, the strip is fitted along a previously determined length with teeth sized and angled so that they may enter through the passage in the strip penetrating direction but they may not come out, as they would collide against the step or tooth that determines the passage narrowing, which shows an inclination or shaping opposite to that of the strip teeth.

In this type of seals, forming the passage narrowing section presents many problems, due to the very small section of said passage. Furthermore, and due to the fact that the portion defining the passage and the teeth of the strip are formed by the same plastic material as the rest of the seal, the strip may then be pulled out by deforming the retaining elements, due to the plastic teeth giving way.

The object of this invention is a seal in which the passage narrowing may be effected easily and above all safely, offering strip retention means, whether fitted with teeth or not, guaranteeing the integrity of the seal.

In accordance with the invention, the passage through which the strip is introduced is fitted with a transversal metal plate fitted with an opening defining the narrowing of said passage. To this end, and in accordance with the invention, the area surrounding the metal plate opening shows approximately radial notches or cuts that determine flexible intermediate rims or tabs that are slightly inclined in the same direction, from their starting point. The internal edge of these tabs limits a minimal girth passage approximately equal to that of the section of the flexible strip lengths not fitted with notches or teeth, but smaller than that limited but said notches or teeth, if the strip is fitted with teeth and slightly smaller if not fitted with teeth.

Thus, the toothed strip may slide freely through the passage, whenever through the narrowing run strip sections not fitted with teeth or notches. On the other hand, and whenever the strip slides in the direction of penetration through sections fitted with teeth

or notches, the tabs or rims that limit the opening of the metal plate bend in the direction of their inclination, thus allowing the passage of said teeth or notches. If in this situation or position the strip is to be pulled out, the tabs act as retaining anchors against which the strip notches or teeth are supported, preventing them moving backwards. Also in the case of toothless strips the tabs flex allowing their entry, but if anyone tries to pull out the strip, the tabs stick into the strip preventing their movement backwards.

The metal plate may be fitted, on the side towards which lean the rims or tabs, with a peripheral wall, thus adopting a bowl configuration.

The metal plate opening may include a wider intermediate area, limited by narrower equal end areas and circular boundary. The flexible strip, on the other hand, presents, along the anchoring strip or strips, a thickening along its longitudinal edges determining two edges, upon which are formed equidistant and conical shaped peripheral offsets, aimed in the same direction, to define the anchorage notches or teeth.

The plate opening may also show other arrangements that are in agreement with the strip section upon which it must act, so that it may present the shape of several aligned secant circles, or either Maltese Cross shaped, ideal for a circular section strip.

Either one shape or the others may cooperate with toothless strips.

The widening of the flexible strip has, in the thickened section in which the passage is located, a housing that leads outside and in which the metal plate or bowl is introduced. Thus, the plastic material strip is shaped approximately as the uniform passage section, later introducing in the fore mentioned housing the metal plate, which shall define the passage narrowing.

The flexible strip may have along its length a graduation that would allow it to show that the strip has been cut and newly used. The flexible strip may also have, near its widening, an actuation tab that in cooperation with two weakening lines would allow manually actuated seal breakage.

The characteristics and advantages of the seal object of the invention may be understood more easily through the following description, made with reference to the attached drawings, showing a non limitative execution example.

In the drawings:

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Figure 1 is a lower plan view of a seal made pursuant to the invention.

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Figure 2 is a side view of the seal in the closed position.

Figure 3 corresponds to detail A of figure 1 at a greater scale.

Figures 4 and 5 are passage sections taken, respectively, as per cut lines IV-IV and V-V of figure 3.

Figure 6 corresponds to detail P of Figure 1 at a greater scale.

Figure 7 is a cross section of the flexible strip, taken as per cut line VII-VII of Figure 6.

Figure 8 is an upper plan view of the plate defining the passage narrowing.

Figure 9 is a plate longitudinal section, taken along the IX- IX cut line of figure 8.

Figure 10 is a cross section similar to that of figure 4, with the metal plate mounted and the flexible strip introduced through the passage.

Figures 11 and 12 represent views similar to those shown in figures 8 and 9 of a plate opening variation.

Figures 13 and 14 represent views similar to those shown in figures 8 and 9 of a second plate opening variation.

Figure 15 represents a view similar to that of figure 1 of a flexible strip variation.

Figure 16 represents a section of figure 15 given by the XVI-XVI cut line.

The seal represented in figure 1 is made up of a flexible strip 1, for example made of plastic material, topped at one of its ends by a rectangular boundary widening 2. This widening presents, as may be better observed in figure 2, a thickening 3, in which a passage 4 has been effected, see figure 1, through which may be introduced the strip 1, as from its end 5.

As may be observed in figures 3 to 5, in the thickening 3 has been, set, besides passage 4, an intermediate housing 6, perpendicular to said passage. This housing leads outside and may be closed using a hatch formed from the widening itself 2 of the flexible strip.

Inside housing 6 is introduced a metal plate 8, figures 8 and 9, presenting an intermediate opening 9, on which boundary are made approximately radial notches or cuts 10 limiting flexible intermediate rims or tabs 11. As may be observed in figure 4, all the tabs or rims 11 lean in the same direction. Plate 8 may be enclosed, on the side towards which lean the tabs 11, by a peripheral wall 12, adopting a bowl configuration which size corresponds to that of the housing 6, described with reference 3 to 5.

In the described example, the opening 9 presents a wider intermediate area 13, limited by end areas 14 equal to each other and of a lesser width, of circular boundary.

The flexible strip 1 features, as may be observed in figures 1 and 2, along a given length, a slight thickening 15 along its longitudinal supports, determining ribs which, as may be better observed in figures 6 and 7, present peripheral conical shaped surface offsets 16, all of them aimed in the same direction, to determine anchorage notches or teeth.

The tabs 11 of the metal plate 8 are sized so that the internal edge 17 of said tabs determines a minimal boundary passage approximately equal to that of the

section of the flexible strip 1 lengths without ribs 15 but smaller than that limited by said ribs.

With the constitution mentioned, forming the flexible strip 1 with its widening 2 and passage 4 does not offer any difficulty, given that said passage has a uniform section. Once the strip is shaped, at its widening 2 is then introduced the metal plate or bowl 8 into the housing 6, figure 10, closing said housing using hatch 7. In these conditions the seal is ready to be used, introducing the flexible strip 1, by its free end, through the passage 4. Upon arriving the ribs 15 to the narrowing defined by the plate 8, its teeth or notches bend the rims or tabs 11 in the direction of penetration of the strip, whereas in the opposite direction they act as retaining anchors, thus preventing strip extraction.

Because the retaining elements are made up of metal tabs 11, total safety is then obtained against the extraction of notches or teeth and, therefore against any seal integrity breaches.

As may be observed in figures 10, 11, 13 and 14, the opening of the metal plate 8 may show various shapes. Thus in the figures 10 and 11, the opening 14' of the plate 8 has the shape of several aligned secant circles. This shape may be used with flexible strips featuring a section with as many ribs, which may also be fitted with teeth or not, or even with flat ribless flexible strips.

The opening 14" presented by the plate 8 of the figures 13 and 14 is specially designed for circular section flexible strips.

Finally figures 15 and 16 feature a seal in which the flexible strip 1 shows flat thickening 15' and is fitted along its length with a grading 18, which mission is to reflect the number of times that the seal has been used, given that due to the strip having a considerable length, it may then be cut and reused.

The fore mentioned seal does also feature, in its flexible strip, close to the widening, a tab 19 matching two weakening lines 20 that do allow breaking off the seal easily without requiring the use of any instrument whatsoever.

It is clear that, on using as a flexible strip a flat profile, this must then present a cross section slightly bigger than the plate opening, so that on being introduced it would then bend the edge of the opening 9, 9', 9", so that it constantly presses upon the flat flexible strip, so that whenever any effort is made to take it out, it would then stick into it preventing its displacement.

## Claims

1.- Safety seal, made of a plastic or similar material flexible strip (1), topped by a widening (2) fitted with a thickening (3) traversed by a passage (4), through which may be introduced the strip (1) using

its free end (5) presenting said passage (4) retaining means (11) that allow the passage of the strip in the direction of introduction, but avoiding its displacement in the opposite direction, characterized because the fore mentioned passage (4) is fitted with a traversal metal plate (8) that has an opening (9, 9', 9''), out of which boundary stick out approximately radial notches or cuts (10) defining intermediate flexible rims or tabs (11), which lean slightly in the same direction, as from their starting point; defining the internal edge of these tabs (11) a minimal boundary passage (9, 9', 9''), slightly smaller to that of the section presented by the flexible strip (1) at the area to be retained, bending the fore mentioned tabs or rims (11) in the direction of their inclination, so as to allow the passage of the flexible strip (1) when it is introduced, whenever in the opposite direction they act as retaining anchorage devices, preventing their withdrawal.

2.- Seal as per claim 1, characterized because the plate (8) is fitted, on the side towards which lean the rims or tabs (11), with a peripheral wall (12), adopting a bowl configuration.

3.- Seal as per claims 1 and 2, characterized because the plate or bowl (8) is located in an intermediate housing (6) formed in the thickening (3) of the widening (2) of the flexible strip (1), which housing (6) leads outward through an opening that may be closed by a hatch (7) formed from the widening itself (2) of the flexible strip (1).

4.- Seal as per claim 1, characterized because the opening (9) of the metal plate (8) features a wider intermediate area (13), limited by equal and narrower, circular boundary end areas (14) ; and because the flexible strip (1) features along the anchorage length or lengths a thickening (15, 15') along its longitudinal edges defining corresponding ribs.

5.- Seal as per claim 1, characterized because the opening (9') of the plate (8) has tangent aligned circles shape.

6.- Seal as per claim 1, characterized because the opening (9'') of the plate (8) has Maltese Cross shape, specially shaped for use with circular section strips.

7.- Seal as per claim 1, characterized because the thickening (15) of the flexible strip (1) features equidistant conical shaped peripheral offsets (16), aimed in the same direction; limiting anchorage notches or teeth.

8.- Seal as per claim 1, characterized because the strip (1) features a graduation (18) along its length and because near the thickening (3) it is fitted with weakening lines (20) laterally topped by a manual actuation tab (21).

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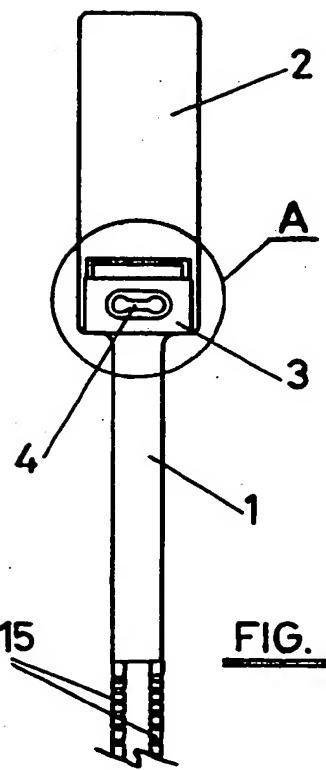


FIG. 1

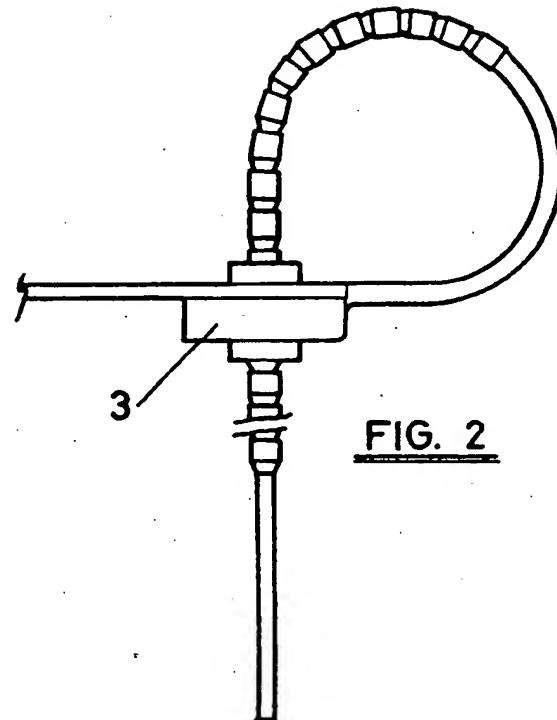


FIG. 2

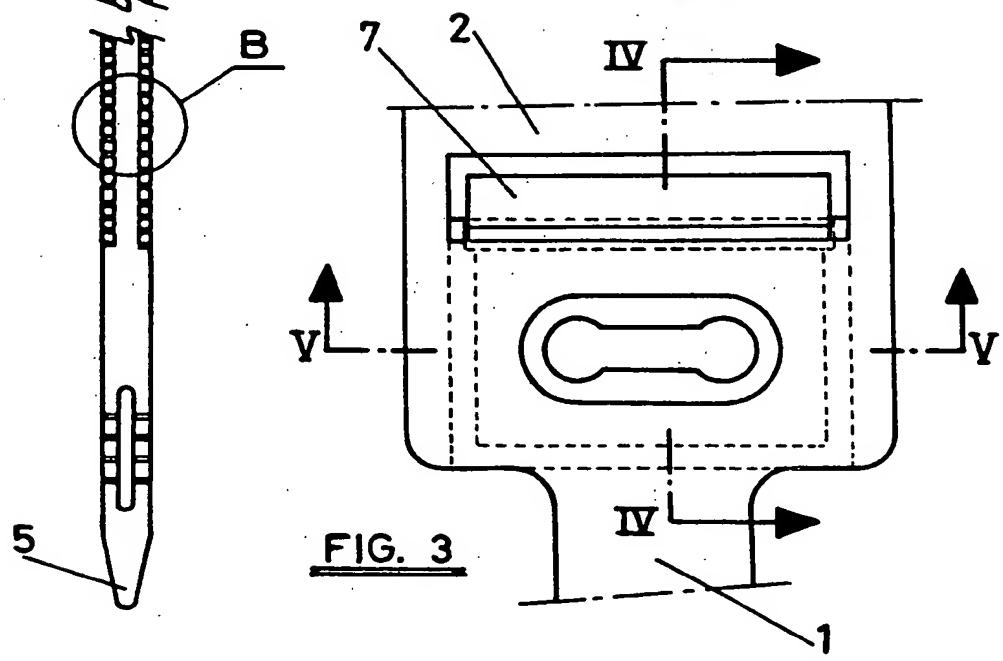


FIG. 3

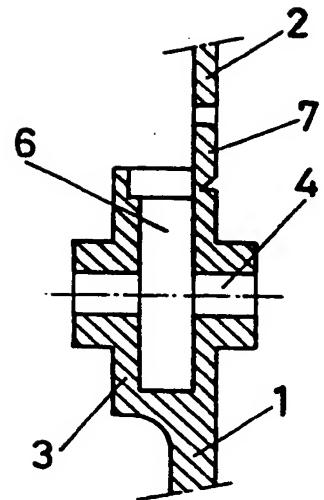


FIG. 4

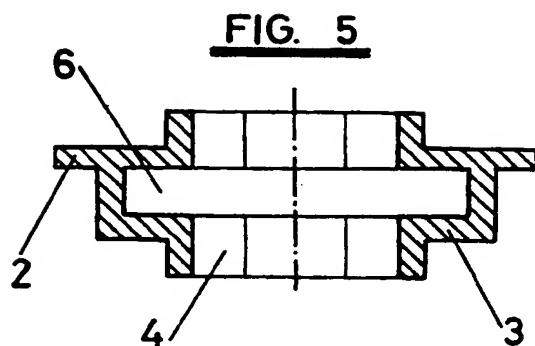


FIG. 5

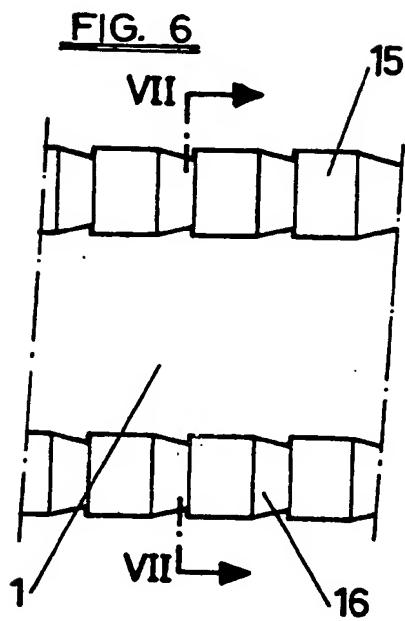
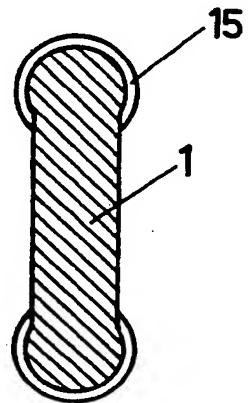


FIG. 6

FIG. 7



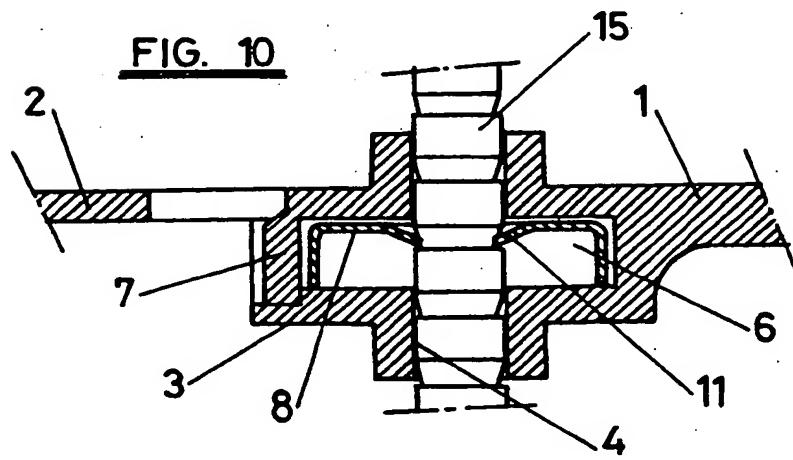
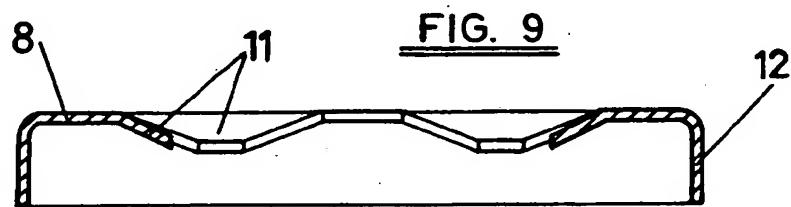
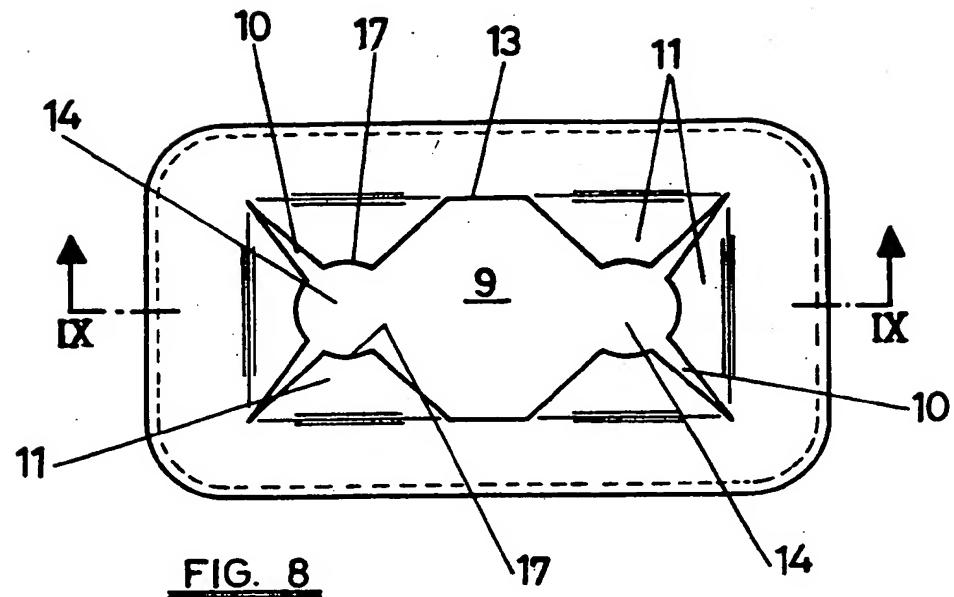


FIG. 11

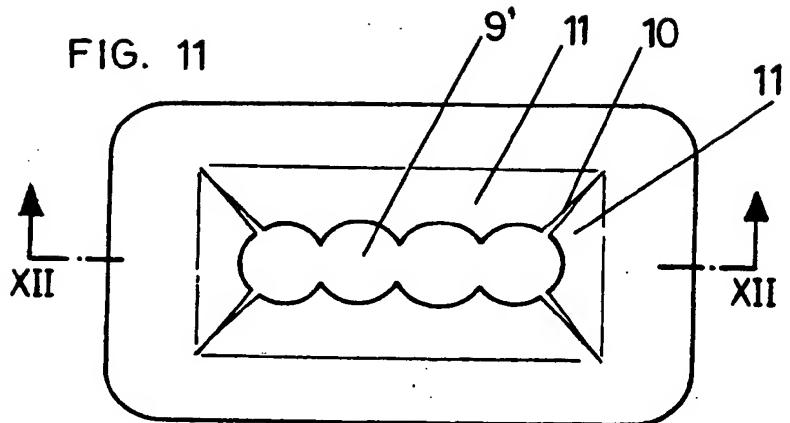


FIG. 12

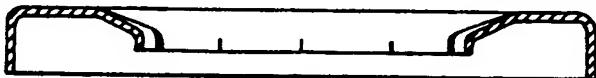


FIG. 13

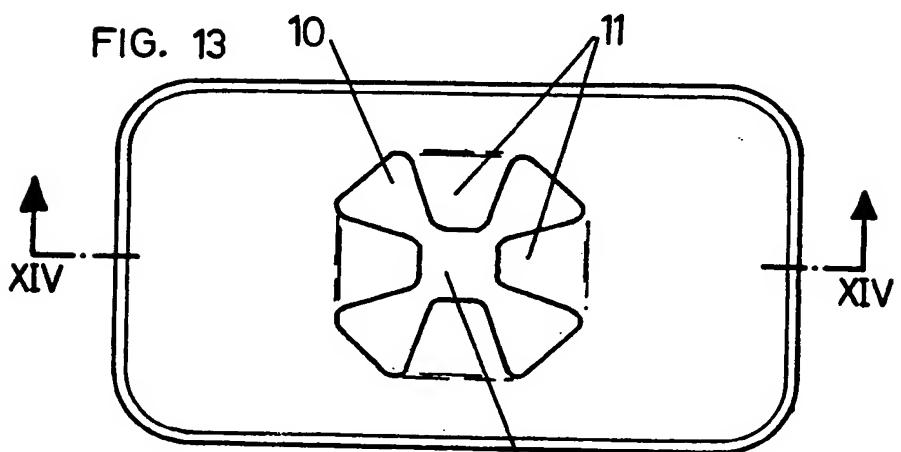
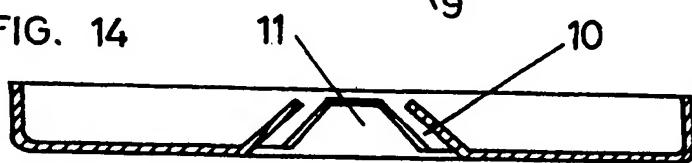
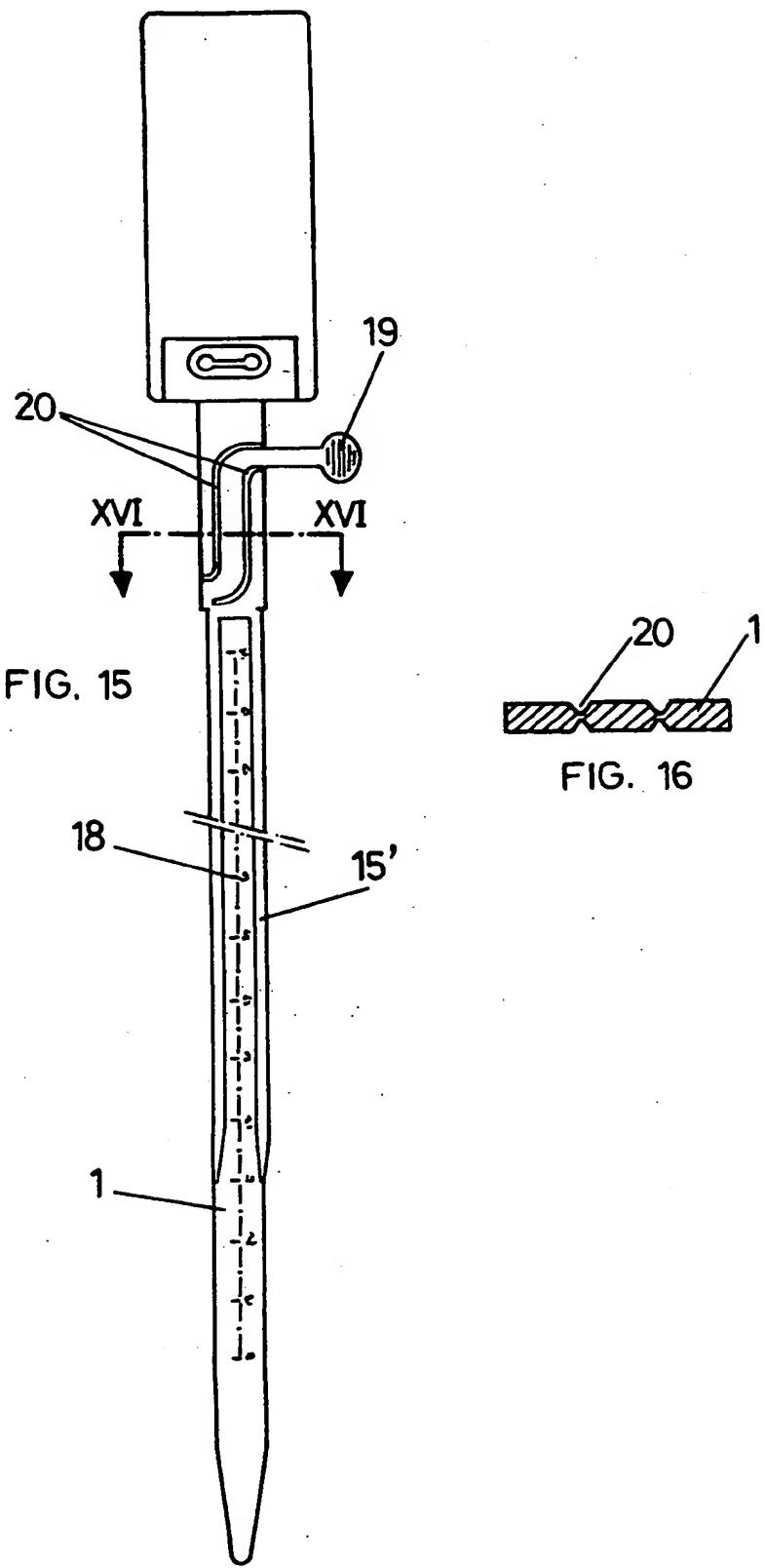


FIG. 14







## EUROPEAN SEARCH REPORT

Application Number

EP 95 50 0045

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	FR-A-2 632 431 (MALACHOWSKY) * the whole document *	1	G09F3/03
A	DE-A-39 06 386 (E. MYRACH) * the whole document *	1-8	
TECHNICAL FIELDS SEARCHED (Int.Cl.6)			
G09F B65D			
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	7 July 1995	Gallo, G	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons ..... & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			